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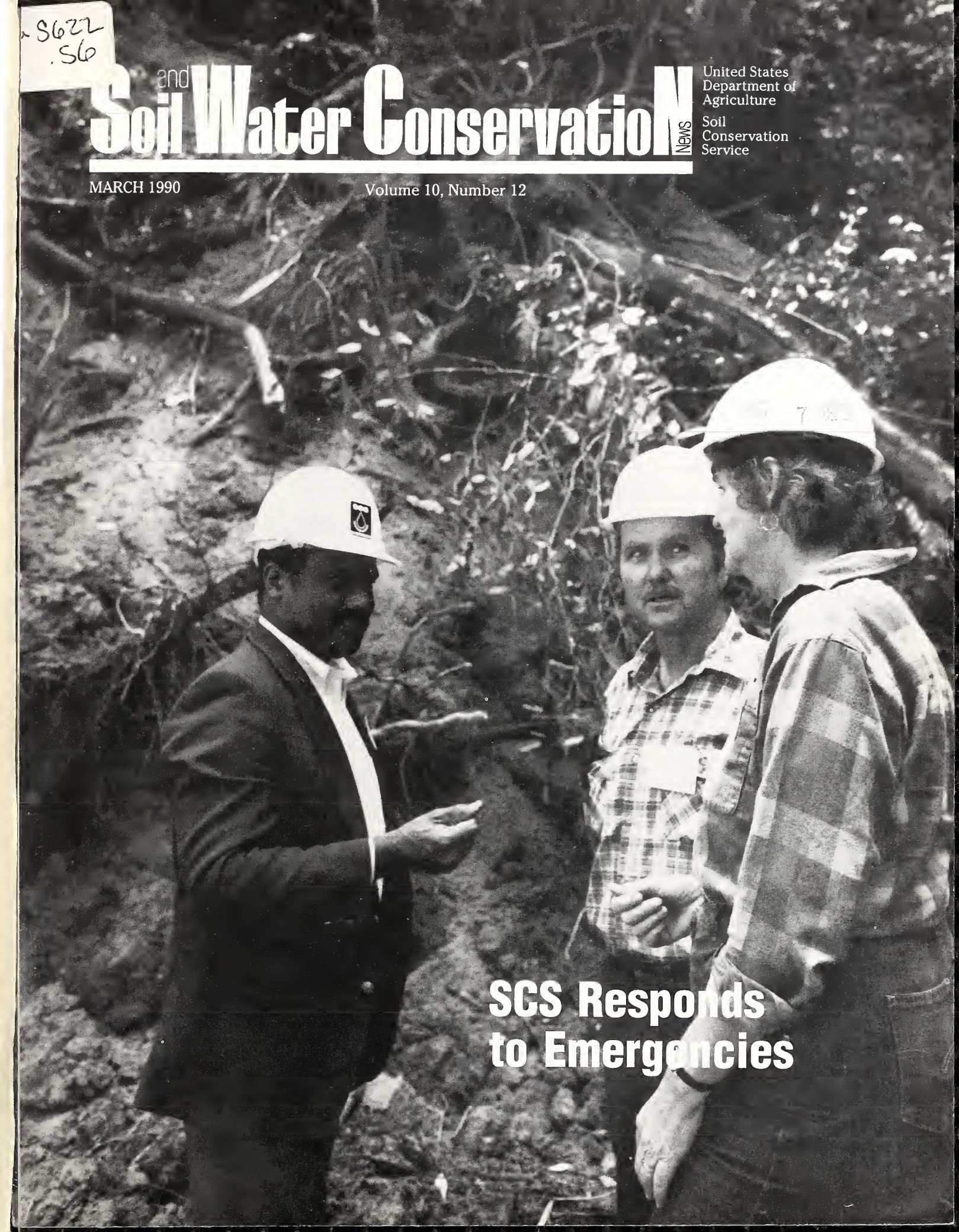

SCS Responds to Emergencies

Cover: Pearlie Reed (left), SCS State conservationist in California, discusses Emergency Watershed Protection procedures with local officials at Corralitos Creek landslide site following the California earthquake. (Photo by Kathy Gugulis.)

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Comments from the SCS Chief:

Our Conservation Team Did It!

Every so often, it's important to stop, sit back, and reflect on where we are and where we are going. I tip my hat to the dedicated men and women in the Soil Conservation Service, conservation districts, cooperating agencies, and especially the producers who have accomplished so much soil and water conservation work in the past 4 years.

Three or four years ago, there were skeptics who thought we'd never be able to meet the deadline for conservation plans under the 1985 Farm Bill. Our goal was to provide producers with practical, cost-effective recommendations for reducing soil erosion. Well, we did it. Not only were the plans prepared, but they have already been implemented on over 25 percent of the highly erodible cropland—well ahead of schedule. It took hard work, determination, and good people relations to make that happen. That's what I call impressive.

What is even more impressive is that together we also accomplished so much in so many other arenas—the Great Plains Conservation Program, Resource Conservation and Development, Small Watershed Program, range management, conservation education, office automation, geographic information services, wildlife habitat improvement, plant materials program, and much more.

But, the good work didn't stop there. When disaster struck—in the form of Hurricane Hugo on the east coast and the San Francisco earthquake on the west coast—SCS employees were ready to jump in and help. When it comes to responding in an emergency, SCS is always out in the front. That is so important—to help people when they are most in need. After reading some of those success stories in this issue, I think you'll understand why I'm so proud of this agency.

This issue also highlights conservation accomplishments from the past year. The annual index is further testimony to all the successes of our conservation team. These two sections are more than just a guide to conservation topics—they give a quick view of the breadth and depth of our conservation efforts.

As for the future, there are exciting and challenging times ahead of us. The National Conservation Program, released last year, identified our two top priorities for the next 5 years. They are: (1) reducing damage caused by excessive soil erosion on rural lands and (2) protecting the quality and quantity of surface and ground water.

Implementing conservation plans by the end of 1994 on the 100 million acres of highly erodible land is our biggest challenge. Our goal here continues to be to provide producers with practical, cost-effective options for controlling erosion. We also need to be practical and use common sense when offering producers recommendations on improving water quality and quantity. Those are goals I am confident that our conservation team can meet.

SCS Responds

Hugo Offers Challenges To SCS

AFTER HURRICANE Hugo passed their homes—just after midnight on September 22, 1989—Soil Conservation Service employees in South Carolina sprang into action to help repair damages in 20 devastated counties.

Littered and blocked roads required innovative ways to quickly help soil and water conservation districts with county damage assessments and to make initial SCS surveys of primary streams clogged and blocked with fallen trees and debris.

And, as always, there was the need for speed. Emergency Watershed Protection (EWP) measures were requested.

Close coordination with county emergency preparedness teams and sponsors resulted in county-wide ordinances allowing SCS and contractors immediate access to private property.

EWP authorizes SCS to provide financial and technical assistance to eliminate or reduce hazards to life and property as a result of a natural disaster.

Latest total damage estimates are nearly $6 billion Statewide, according to the South Carolina Office of Economic Research.

After Hugo—the SCS/EWP Cleanup

County/No Project Name	Mile Water Courses Cleared	Homes, Buildings Benefitted	Roads, Bridge Crossings Benefitted	Also Benefitted
Berkeley 1 Goose Creek	35	1,600	120	3 schools; business district
Berkeley 2 Moncks Corner	12	560	100	2schools; business district
Berkeley 3 St. Stephens	13	800	25	2 schools; business district; large industry
Berkeley 4 North Charleston/Hanahan	16	1,100	110	3 schools; business district
Charleston 1 McClellanville	13	350	25	2 schools
Charleston 2 Isle of Palms	4	1,000	50	business district; marina; 200 culverts (sand cleanout)
Clarendon Manning/Summerton	8	600	35	3 schools; shopping center
Darlington City of Darlington	4	350	8	4 schools; park
Dorchester 1 Summerville	12	1,432	53	school; business district; park
Dorchester 2 Summerville 2	18	1,600	130	3 schools
Dorchester 3 Summerville 3	15	1,100	80	school
Florence Florence	2	500	11	park; ripraping on road crossing
Georgetown Murrell's Inlet/North Litchfield				Started 12/18/89; cleanup of watercourse; marshland
Kershaw Camden	5	60	15	2 schools; park
Lancaster City of Lancaster	11	100	35	2 schools
Lee Bishopville/Elliott/Lynchburg	6	543	32	2 schools; 100 apartments; business district
Orangeburg Holly Hill/Elloree	12	420	54	3 schools; business district; park; minority contractor
Sumter 1 City of Sumter	5	740	7	school; 2 dams
Sumter 2 Pinewood	4	608	8	school
Williamsburg 1 Greeleyville	3	100	5	school; business district
Williamsburg 2 Hemingway	3	120	15	school; business district
TOTALS	**201**	**13,603**	**918**	

Hurricane

"We found many primary streams obstructed by fallen trees and other debris," said Billy Abercrombie, Soil Conservation Service State conservationist. "Additional rainfall can overflow these watercourses and flood bridges, roads, homes, and other facilities."

Of the 2,400 miles of obstructed streams, over 1,000 posed an immediate threat to life and property, according to Howard Tankersley, watershed projects director in the SCS National Headquarters in Washington, D.C.

In hard-hit counties like Charleston, residents lost most of their electrical, telephone, and water services. Thousands of buildings were damaged, some totally destroyed.

At McClellanville, 25 miles northeast of Charleston, Hugo's 160-mph winds splintered 70 to 80 percent of the mature longleaf pines and live oaks in Francis Marion National Forest, according to Abercrombie.

The McClellanville EWP project involved clearing trees, boats, parts of houses, and other debris from 13 miles of watercourses.

"Pines were wrenched around at midtrunk and the tops popped off, leaving a forest of toothpicks," Abercrombie described. "These are trees with 18- to 24-inch-diameter bases."

Sullivan's Island and Isle of Palms, Charleston's barrier islands, looked like a "war zone," according to Abercrombie. The 13- to 17-foot tidal surge spun around a major bridge span, sunk numerous boats, rearranged 70 miles of coastal dunes, and picked up beach houses, carrying some a half-mile inland.

The Isle of Palms EWP project involved clearing 5 miles of channels and cleaning sand blockages from 200 culverts and the stormwater disposal system.

Charles Glover, SCS district conservationist in Monck's Corner, said the devastation was so total that nobody could move around. He couldn't even drive around to check damages. What he remembers most vividly that night were all the trees popping.

Chronology of South Carolina's Response to Hurricane Hugo

Day 1—Day before storm hits: SCS State office advises field offices to protect government vehicles and offices.

Day 2—Day of storm: Affected county personnel protect themselves and families and, if possible, begin assessing natural resource damages. Field offices advise State of their counties' damages. State advises SCS National Headquarters (NHQ) of known damages to natural resources and of needed emergency support.

Day 3: Assessments coordinated with Federal Emergency Management Agency. Teams with varied State office technical specialists form to assist field offices in conducting assessments. Teams are sent out to affected counties.

Days 3-6: Preliminary assessments are completed by teams working with local units of government and local soil and water conservation districts. Such local units request Emergency Watershed Protection (EWP) assistance from SCS.

Day 7: Damage assessments and EWP funding requests are sent to SCS Chief. Field offices begin obtaining landrights and project agreements. State engineering staff helps field offices prepare project specifications.

Day 8: NHQ notifies State of EWP funding approval. NHQ/State notify other Federal, State, local, and private agencies of their intent to activate EWP program, and requests input, particularly for environmental, archaeological, endangered species, etc., aspects. Contracting officers put bid packages together for EWP projects. Field offices notify media, property owners, and others of upcoming EWP work.

Day 9: Contractors see sites.

Day 10: Contractors submit their bids. Bids are opened.

Day 11: Selected contractors begin work under direction of SCS.

Toppled, uprooted mature trees and other storm debris clogged flood-relief canals on Isle of Palms, S.C., following Hurricane Hugo. (SCS photo.)

Earthquake

About 80 miles inland in Sumter, residents awoke to find their streets undrivable. Primary streams were clogged by fallen trees and debris. Rural residents in many storm-damaged counties would have no electricity for 2 weeks.

A saving grace, if such is possible, was the speed of Hugo's track, 20-plus mph. It passed over so quickly that Charleston had only 3 to 5 inches of rain (one-third of a "normal" hurricane), according to Abercrombie. Sumter had only 3 inches. Reduced flooding helped SCS start quickly on damage surveys and subsequent EWP work.

The table (p.3) shows EWP accomplishments in South Carolina through January 5, 1990.

EWP clean-out of mature trees and other storm debris from upper Home Branch in Holly Hill, S.C., began promptly following Hurricane Hugo. (SCS photo.)

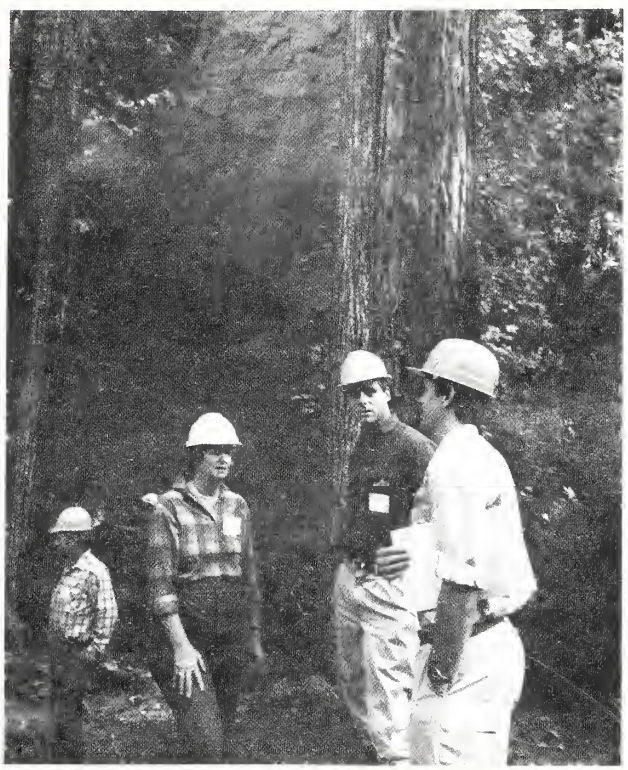
Abercrombie estimated that work done so far benefits 13,600 homes or over 30,000 people. Transportation cost benefits are highly significant for the nearly 1,000 miles of road and bridge crossings improved so far.

Paul G. DuMont, associate editor, *Soil & Water Conservation News,* SCS, Washington, D.C.

SCS Helps Earthquake Cleanup

THE EARTHQUAKE violently shook everything and everybody in north-central California on October 17, 1989, at 5:04 p.m. local time.

The temblor, known as Loma Prieta after the fault where it occurred, measured 7.1 on the Richter scale. It caused a loss of life and property, leaving thousands homeless in a 10-county area. Latest total damage estimates are nearly $6 billion Statewide, according to the California State Office of Emergency Services.



Rich Casale (second from right), SCS district conservationist from Aptos, Calif., strategizes with local officials about clearing landslide-caused mud and debris from Corralitos Creek following California earthquake. (Photo by Kathy Gugulis.)

[The] SCS survey teams from the field and area offices and a helicopter survey team began assessing damages to streams and channels in the affected counties immediately after the quake.

Although more publicized damages occurred in city areas, landslides choked primary streams and other watercourses in rural areas, undermining and damaging bridges, roads, and dams. Help was needed immediately to prevent flooding.

The Soil Conservation Service acted promptly by providing technical and financial assistance, under the Emergency Watershed Protection (EWP) program, to local areas suffering from the effects of the quake.

SCS survey teams from field and area offices and a helicopter survey team began assessing damages to streams and channels in the affected counties immediately after the quake.

They found that sediment and runoff from landslides caused by the earthquake were entering many watercourses and restricting water flow.

SCS and State agencies made assessments of nearly 1,500 small, private impoundments constructed with SCS assistance and 200 larger dams. Most of these structures are for erosion control and irrigation.

SCS advised landowners on how to repair dams and remove stream blockages and how to prevent or reduce the chance of further damage.

Rich Casale, SCS district conservationist at Aptos, said their field office staff received and handled 45 requests in Santa Cruz County during the first 2 weeks for soil conservation assistance directly related to earthquake damages.

The first project approved for EWP funding was in Santa Cruz County. Earth, boulders, and other debris were removed from a triple-slide blockage of Corralitos Creek in the Eureka Canyon Road area.

"Backed-up water was 35 feet deep behind one slide and 10 to 15 feet deep behind another slide, which posed severe flooding dangers to homes and roads downstream," said Luana Kiger, SCS area conservationist in Salinas.

SCS worked with the Santa Cruz Resource Conservation District, the California Department of Fish and Game, and Santa Cruz County officials on this EWP project.

Cleanup got underway October 20, less than 3 days after the quake, and was completed within 2 weeks.

Herman Calhoun, watershed projects assistant director at SCS National Headquarters in Washington, D.C., said this EWP project cost $300,000. Pearlie Reed, SCS State conservationist in California, estimated it would prevent a potential $1.6 million in damages caused by potential flooding further downstream.

John Plain, public affairs specialist, SCS, Davis, Calif., and **Paul G. DuMont,** associate editor, *Soil & Water Conservation News,* SCS, Washington, D.C.

SCS checked nearly 1,500 small impoundments for fractures and faults following California earthquake. (SCS photo.)

Heavy equipment carries out EWP cleanup of triple landslide at Corralitos Creek and Eureka Canyon Road blockage following California earthquake. (SCS photo.)

1989 Conservation Highlights

Summary of Activities of the Soil Conservation Service for Fiscal Year 1989

The Soil Conservation Service is the agency of the U.S. Department of Agriculture (USDA) that provides technical assistance in planning and applying conservation practices and systems to reduce soil erosion, protect and conserve water, and reduce upstream flood damage. In fiscal year (FY) 1989, SCS provided assistance to 1,283,246 landowners and units of government, 1,004,347 of whom applied at least one conservation practice. This resulted in 62.7 million acres of land receiving some form of conservation treatment.

Most SCS assistance is provided to farmers and ranchers who are cooperators with the Nation's nearly 3,000 local soil and water conservation districts. This past year, 625,430 landowners became new district cooperators. SCS provides cooperators with technical assistance in developing conservation plans for their land and in implementing the conservation practices in their plans.

Following are highlights of SCS activities during FY 1989 (October 1, 1988, to September 30, 1989).

Agricultural Conservation Program

Over 140,000 farmers and ranchers assisted by SCS during FY 1989 installed conservation practices partly financed by the Agricultural Conservation Program (ACP) administered by USDA's Agricultural Stabilization and Conservation Service. The total acres benefited or served by ACP last year were 10,145,117: nearly 13,500 operators installed terrace systems that benefited 964,000 acres, and 10,900 farmers and ranchers installed grassed waterways serving 224,000 acres. Technical assistance was provided by SCS and others. Also through ACP, SCS helped install water-conserving practices that benefited 1.2 million acres.

Cartography and Geographic Information Systems

Fifty-one SCS offices in 33 States implemented the Geographic Resources Analysis Support System-Geographic Information System (GRASS-GIS) software on FOCAS hardware. GRASS is being used to digitize soil surveys and support natural resource planning and analysis. Enhancing the use of the GRASS software is centered on developing user-friendly interfaces to other application software such as CAMPS and water quality models. SCS designed a photo interpretation training course and is conducting classes for field office personnel. The course teaches basic skills for using aerial photographs for conservation planning and soil mapping.

Colorado River Salinity Control Program

USDA and the U.S. Department of the Interior continue a joint program to reduce the amount of salt entering the Colorado River from irrigated lands. The application of irrigation water management practices through contracts with landowners under the Colorado River Salinity Control (CRSC) Program has reduced by 20,000 acre-feet per year the amount of water previously lost to deep percolation and to recharge of salt-bearing subsoils and geologic formations. The result has been a reduction by 76,000 tons per year in the amount of salt entering the Colorado River. Through the end of FY 1989, a total of 326 CRSC contracts have been signed obligating nearly $7.2 million in cost-share funds.

Conservation Tillage

According to a survey by the Conservation Technology In-

formation Center, farmers used conservation tillage on more than 72 million acres in 1989. The Center reported significant increases in no-till, full-season soybeans for the second year in a row. The 1989 figure is 19 percent higher than 1988 and 36 percent higher than 1987. In double-cropped soybeans, 42 percent of the acres were in no-till and 54 percent fell under conservation tillage.

No-till gained acreage in all crop types except full-season and spring-seeded small grains. Ridge-till gained acreage for the eighth consecutive year: 1989's 2.7 million acres were a 15-percent increase over 1988's. Also included in no-till acreage in 1989 was 18 percent of all double-cropped grain sorghum.

There was an increase in total planted acres in 1989 from 272 to 280 million acres.

Cultural Resources

The national cultural resources training program will soon be available for distribution. The program was developed to reduce the cost of meeting requirements of the National Historic Preservation Act of 1966. A combination of videotapes, computer simulation, and educational materials will be used in self- or group-study modules to give field personnel practical skills in dealing with cultural resource concerns. A test utilizing GRASS software is being conducted in coordination with other GIS efforts in Virginia. Applications are to include watershed modeling and locational inventories for farm planning.

Economics

SCS has included a Cost and Return Estimator (CARE) package in the CAMPS system for field office use. CARE is a computer program to develop cost and return estimates for farm enterprises. It includes a "quick-budget" feature designed for quick and easy use by field personnel. The package has been shared with the Cooperative Extension System and is being used as an aid for their work in farm management.

The Interactive Conservation Evaluation (ICE) package has been modified to include ephemeral gully erosion among the resource problems that can be evaluated. ICE performs a comparison of net income associated with any number of user-specified conservation alternatives. Both ICE and CARE are available in the SCS CAMPS system as well as in a freestanding DOS format.

Emergency Assistance

SCS funded approximately $12.5 million worth of emergency watershed protection work during the past fiscal year to help restore and protect areas damaged by floods, fires, and other natural disasters in 32 States.

Engineering

During FY 1989, 10 of the 22 planned self-study training modules on dam safety were developed by an interagency group and have been distributed to States and National Technical Centers.

The overland flow profile version of the Water Erosion Prediction Project (WEPP) should be ready for an initial field test in 22 counties in early summer of 1990.

The development of Field Office Engineering Software (FOES), which will help field office staffs in planning, designing, and installing conservation practices, is progressing. Distribution of the first software module, targeted to erosion control practices, is planned for the end of 1990.

Fish and Wildlife

SCS provides technical assistance to landowners in the maintenance and improvement of fish and wildlife habitats. During the past fiscal year, this assistance—much of it helping to implement the conservation provisions of the Food Security Act of 1985—led to improved wildlife management on more than 1.1 million acres.

Flood Plains

SCS completed 19 flood plain management studies and 7 reimbursable flood insurance studies in 1989. These studies are used to develop local flood plain management programs.

Food Security Act of 1985

The Food Security Act (FSA) of 1985 contained several provisions to reduce soil erosion on highly erodible land and to protect wetlands. Implementing these provisions, including the task of determining all areas of highly erodible land and wetlands, has been the major focus of SCS field office staffs. The conservation compliance provision of the FSA requires that anyone who wishes to remain eligible for USDA program benefits and farms highly erodible cropland must have a conservation plan approved by December 31, 1989, and implemented by the end of 1994. As of the end of FY 1989, SCS field office personnel had helped develop approved conservation plans for 133 million acres of highly erodible cropland—or 98 percent of the acres expected to need plans by December 31, 1989. Plans have been implemented on 39 million acres, or 29 percent of the affected land.

During FY 1989, SCS increased implementation efforts on the wetland provisions of the Food Security Act. Wetland determinations are scheduled for completion by December 31, 1991. At the close of FY 1989, 795,000 or 25 percent of the wetland determinations had been completed. To remain eligible for USDA program benefits, farmers cannot plant an agricultural commodity on wetlands converted after December 23, 1985.

Under another provision of the FSA, the Conservation Reserve Program (CRP), SCS has provided technical assistance to nearly 333,000 landowners who have agreed to

plant about 34 million acres of highly erodible and environmentally sensitive cropland to grass, trees, or wildlife cover and to maintain the new plant cover for at least 10 years. More than 48,800 acres of the CRP land consists of filter strips, and 2.2 million acres is planted in trees.

During 1989, the fourth year of the program, there were two signup periods when landowners could submit bids to enter land into the program. SCS field office staffs determine the eligibility of the land submitted in the bids. Landowners have submitted over 402,000 bids on 44 million acres. SCS employees helped landowners develop conservation plans for the land accepted. Participating landowners receive cost-sharing assistance in establishing the new cover and annual payments (averaging nearly $51 per acre, nationally) from USDA's Agricultural Stabilization and Conservation Service, which administers CRP.

Forestry

SCS provides technical assistance to landowners to maintain and improve the forest resource on private lands. During this past year, the agency made suitability determinations for approximately 800,000 acres of eroding cropland planted to trees under the Conservation Reserve Program. Integrated Forest-Soils Management (INFORM), the CAMPS module designed to assist field office staff in planning forest land, is being field-tested.

Great Plains Conservation Program

Through the Great Plains Conservation Program (GPCP), SCS provides technical and financial assistance to landowners to minimize the hazards of recurring drought and wind and water erosion in the 10 Great Plains States. In FY 1989, 953 farmers and ranchers signed long-term GPCP contracts to apply conservation measures on 6.1 million acres. Work was completed on 623 contracts covering 4.2 million acres.

Ground Water Research

In keeping with USDA and SCS policy of interagency cooperation and coordination in water quality activities, SCS is participating with other Federal and State agencies, universities, and private sector groups and individuals in a major research initiative in agricultural chemical management. This activity is focused on agricultural practices and the transport and fate of agricultural chemicals in the Corn Belt. Nationwide expansion of this research and its application is anticipated.

SCS continues to provide support to many other ongoing ground water research activities related to agriculture, such as the animal waste storage study through Clemson University, Clemson, S.C.

Information and Education

Keeping landowners and the general public informed about the conservation provisions of the Food Security Act of 1985 continued to be a high priority during the past fiscal year. Working with local conservation districts and other USDA agencies, SCS employees at all levels assisted the news media, held field days and demonstrations, gave talks and audiovisual presentations to civic groups, exhibited at meetings, and prepared photo features, factsheets, brochures, and other informational material. A national direct mail/media

campaign alerted landowners to meet the 1989 deadline for conservation compliance plans. Work began on a national public information campaign on how to implement conservation plans. The 5-year campaign will begin in 1990.

SCS continued its "We Owe It To Our Children" national public service campaign to promote the conservation ethic. Television, radio, and print public service announcements and color posters were released for the campaign's first three phases: "The National Treasures;" "The Monuments;" and "They Count On Us." To date, an estimated 90 million Americans have been exposed to the campaign's stewardship message. The material encourages people to call 1-800-THE SOIL for a packet of information on soil and water conservation. Material for the fourth phase, "The Land," is scheduled for release in spring 1990.

Educational assistance was provided to several national publications and publishers including the National Science Teacher's *Science and Children* and *Science Scope* magazines, which included two SCS transparencies with accompanying articles featuring hands-on activities. The educational relations staff exhibited at five major national educational and civic organization conventions including the National Science Teachers, National Biology Teachers, Ag in the Classroom, General Federation of Women's Clubs, and FFA. The staff served as national judge for the National Association of Conservation District's Teacher and District of the Year Awards Program, the National Endowment for Soil and Water Conservation Program, and several other national conservation programs.

Information Resources Management

SCS continued to install microcomputers and minicomputers in field offices as part of the Field Office Communication and Automation System (FOCAS). More than 2,780 field offices now have FOCAS equipment, and training is being provided to field office personnel.

The Computer Assisted Management and Planning System (CAMPS) software has been loaded on 2,540 field office computers. There are 29 States that have fully implemented CAMPS at the field office level. CAMPS is the SCS-developed software that will be used in all field offices for conservation planning, conservation practice design and application, management of natural resource data bases, and office management. All nationally developed software programs and data bases for use at a field office will go into CAMPS.

The purpose of FOCAS and CAMPS is to increase the efficiency of the field office as well as improve the quality of the assistance provided to farmers and ranchers.

International Conservation

This past fiscal year, 565 assignments of SCS personnel to 37 countries were completed—the highest number of assignments for one year in the history of SCS. Agency representatives carried out the following objectives:

- Provided international conservation assistance;
- Shared soil conservation technology through scientific and technical exchanges with other countries that have similar soil and water conservation problems; and
- Participated in meetings of international technical and professional societies.

SCS also provided opportunities for 321 foreign nationals to receive specialized study in the United States. With the support of National Headquarters, National Technical Centers, States, area and field offices, representatives from 44 countries were given the opportunity to gain a better understanding of soil and water conservation activities in the United States.

Limited Resource Farmers

SCS has joined other USDA agencies in a special initiative to help limited resource farmers. In the past year, the Agency has taken a close look at the Small Farm Program at Kentucky State University in Frankfort, Ky. Their program connects well-trained paraprofessionals with limited resource farmers. Farmers graduate from the 4- to 5-year program with a better understanding of farm management, an average increase in gross sales of $10,000 annually, and a better awareness of USDA services available to them. The program is so effective, it is being considered by SCS and Kentucky State University as a national model. If adopted as a national model, Kentucky State will establish a center for training SCS employees on effectively working with limited resource farmers.

Neighbor-to-Neighbor

Neighbor-to-Neighbor, a grass-root's outreach program, is breathing new life into the conservation ethic through volunteer farmers, ranchers, and urbanites who serve as hosts to people who want to view the conservation practices they have applied to their land. Visitors may talk with their hosts and walk the land with them, or take self-guided conservation tours.

The program was the vision of one conservationist working in the 12-county Platte Territory of Missouri. It has expanded throughout Missouri and Nebraska and, because of its effectiveness, is being considered by SCS (together with the Extension Service and the Agricultural Stabilization and Conservation Service) as a national outreach program. A factsheet titled "Neighbor-to-Neighbor Conservation" outlines implementation of the program in a community setting.

Plant Materials
SCS plant materials centers (PMC's) cooperatively released 11 new conservation plants in 1989. Of 295 conservation plants released to date, over 200 were produced commercially last year. These plants produced 17.9 million pounds of seed and 17.7 million plants. The PMC's are currently evaluating about 31,000 plants and conducting 3,300 field trials on farms and ranches.

Range and Pasture
The contract with the Texas Agricultural Experiment Station has resulted in computer-assisted Grazing Lands Application software for field office use. This software will enable SCS planners to provide clients with many more alternatives, in less time than the current manual system. Initial training has been provided for all States.

A range study team has been established at the Midwest National Technical Center, Lincoln, Nebr. This team will investigate the impacts of management decisions on grazing lands using the WEPP technology and equipment.

The first of the positions established to acquire new technology in range management is now operational at the South National Technical Center, Fort Worth, Tex. The results of a thesis by a graduate student in expert systems have been incorporated in the Grazing Lands Applications software. The student will assist SCS in the development of training tools and the application of expert systems for range management.

RCA Appraisal
The final version of The Second RCA Appraisal was also released in 1989. The appraisal summarized the best data available on resource issues including land use, erosion, range condition, and water supply and use. It reported the results of preliminary estimates of the extent of offsite damage caused by erosion, the potential for water quality problems in watershed areas, the extent of soils affected by excess salts and sodium, and the relative diversity of wildlife habitat in the Nation's regions. It projected future soil and water use under several sets of specific conditions. The appraisal provided the basis for developing the NCP and is useful to analysts studying alternatives for consideration for the 1990 farm bill. SCS provided guidance and assistance to the Soil and Water Conservation Society (SWCS) in its evaluation of USDA's implementation of the conservation provisions in the Food Security Act (FSA) of 1985. The SWCS evaluation indicated that, when the measures called for in the compliance plans are fully implemented, erosion will be reduced about 50 percent. The evaluation identified issues of concern that must be addressed in order to ensure efficient implementation of the plans.

Resource Conservation and Development Areas
With assistance from SCS, 1,311 measures were completed during FY 1989 to conserve the natural resources, promote the economic development, and improve the quality of life in 189 Resource Conservation and Development (RC&D) Areas. SCS provides USDA leadership for the RC&D Program, but local RC&D councils set their own objectives, goals, and priorities, and they approve each measure.

Resources Inventory
Data collected for the 1987 National Resources Inventory (NRI) have been finalized and distributed. SCS State and area office personnel have been provided direct, automated access to the NRI data base through "NRI Information System" software, available for use on their 3B2 computer systems.

Efforts to streamline the NRI process have been initiated, based upon recommendations made by a national work group. Included are implementation of a continuous inventory process, use of data collection teams headed by State resources inventory specialists, and increased use of remote sensing.

River Basin Studies
SCS leads USDA cooperation with other Federal, State, and local agencies in making investigations and surveys of river basins to develop local implementation plans that solve or reduce water and related land resource problems in agricultural, rural, and upstream watersheds. Rural revitalization is encouraged by development of agricultural resources, flood reduction, and water quality improvement. During the past year, 76 river basin studies were in progress in 49 States and 14 studies were completed.

Rural Abandoned Mine Program
Through the Rural Abandoned Mine Program Act, SCS provides technical and financial assistance for reclaiming soil and water resources on rural lands adversely affected by coal mining. By the end of FY 1989, 881 contracts had been signed obligating $78.2 million in financial assistance. Work done under these contracts has eliminated 1,545 safety and health hazards, and has improved water quality in 58,000 acres of lakes and 536 miles of streams.

Rural Clean Water Program
The Rural Clean Water Program (RCWP) was created in 1980 to test the effectiveness of the conservation practices considered best management practices in solving nonpoint-source water quality problems. To date, 2,363 contracts costing $35 million have been approved in the 21 RCWP project areas. Information gained from monitoring the RCWP projects is being used to develop and implement water quality policies and programs.

Rural Development
Rural enterprise teams, made up of representatives from SCS and other USDA agencies, helped rural communities to assess their development needs and to prepare plans for addressing these needs. The teams also provide technical assistance. This past fiscal year, SCS assisted 17,881 units of government.

Small Watersheds
SCS began construction on 1 new small watershed project in 1989, approved planning for 18 projects, authorized installation of 19 projects, and completed construction on or closed out 14 projects. Small watershed projects combine structural and nonstructural conservation practices to reduce erosion and flood damage and to provide water for agricultural, municipal, and industrial needs in rural areas.

Snow Surveys
SCS issued more than 3,500 water-supply forecasts during the past fiscal year as part of its Snow Survey Program in the Western States.

To monitor the snowpack at higher elevations, the program relies extensively on data transmitted automatically from remote collection stations in its Snow Telemetry System (SNOTEL). As part of a $6 million, 6-year plan to upgrade SNOTEL, the agency has put state-of-the-art electronics in nearly all of its SNOTEL sites. Improvement of the two master stations and the central computer system will be initiated in FY 1990. SCS has initiated steps to form a Climate Data Access Facility at the West National Technical Center. The facility will provide SCS offices with timely climate data electronically.

Sociology

The Economics and Social Sciences Division broke new ground this year by providing technical assistance on the adoption and diffusion of windbreak technology. This was accomplished independently in each SCS region. Technical assistance was also provided to selected field offices on presenting the message of reduced chemical input in ways that are acceptable to land owners and managers.

Technical input was completed for training modules covering conflict resolution, group dynamics/leadership identification, social information, and adoption/marketing. These modules will be available early in FY 1990. A summary of an innovative workshop on "Working More Effectively with Native Americans" has been completed and will be printed and distributed in FY 1990. In March 1989, a combined workshop was held for Northeast and Midwest sociological coordinators. Emphasis was given to sociological techniques in conservation operations and water resource planning, with a particular focus on working with disadvantaged communities and limited resource farmers and ranchers.

Soil Conservation Service History

Activities included publications on the history of the development of the conservation provisions of the Food Security Act of 1985 for a Soil and Water Conservation Society volume, an article on the work of the Soil Conservation Service in the Great Plains for the quarterly journal *Agricultural History,* and entries in the *Encyclopedia of Southern Culture.*

Other activities included speeches to national meetings, such as the National Conservation Engineers, and historical interviews on the snow survey program.

Soil Erosion Research

SCS continued working with USDA's Agricultural Research Service and other Federal agencies in the extensive data collection and testing required for the development of improved methods for estimating water erosion, including ephemeral gully erosion, and wind erosion. Special emphasis was on the Water Erosion Prediction Project and the Wind Erosion Prediction System. When fully developed, these process-based erosion prediction technologies will provide a new generation of tools for estimating soil erosion.

Soil Surveys

The Soil Survey Division continued to streamline its organizational structure and to make functional changes to meet the needs of the 1990's and beyond. The Soil Geography function in National Headquarters was combined with the Soil Interpretations staff located at the National Soil Survey Center at Lincoln, Nebr. Also, the International Soils Program was renamed the World Soil Resources.

New soil surveys were published for 79 areas in FY 1989. Each survey describes the physical and chemical characteristics of the soils in the survey area, generally a county. The soils are named and classified according to soil taxonomy, a nationwide classification system. The soil surveys provided interpretative information for various uses such as agronomic, engineering, woodland, range, recreation, wildlife. Detailed maps showed where each soil type was located. Soil mapping priority in FY 1989 was on croplands, to meet conservation planning needs of the Food Security Act of 1985. SCS mapped and updated a total of 35 million acres during the year, and cooperating agencies mapped and updated an additional 8.9 million acres.

Strategic Planning and Policy Analysis

On January 19, 1989, President Reagan transmitted to Congress USDA's National Conservation Program (NCP) for Soil and Water for 1989-1997 and a statement of the policies upon which the program is based. The program will provide guidance to the conservation programs of eight USDA agencies for the next 10 years. SCS has leadership responsibility for development of the program. The final program announced in January will:

- Direct activities of conservation programs to two top priorities—control of excessive soil erosion on rural lands, and protection of the quality of surface and ground water in order to maintain the quantity of water available for beneficial uses;
- Strengthen the conservation partnership through efforts to increase planning assistance to State and local Governments, and to expand assistance to small-scale, limited resource, and minority producers; and
- Increase consistency and cost-effectiveness of all USDA conservation activities through continuation of the 1982 NCP initiatives with new emphasis on program consistency; low-input, sustainable agriculture; and technology development.

USDA has made considerable progress in implementing the new directions. SCS has played a leading role in

the development of implementation activities by providing leadership and staff support for:

- The interagency committee that developed an integrated, 5-year plan for USDA's water quality initiative;
- The USDA task force charged with developing the strategy for implementing a "no net loss of wetlands" policy;
- The Farm Bill Conservation Issues Work Group that identified goals and objectives for USDA proposals for the conservation title of the farm bill and that conducted analyses to identify and defend USDA positions on issues of greatest concern to USDA conservation activities.

SCS also initiated efforts to strengthen the agency's capability to conduct policy analysis by:

- Developing pesticide, nitrogen, and sediment balance indicators that can be incorporated in the modeling systems to permit analysis of water quality impacts of alternative policies; and
- Updating the soils data base used in the major modeling systems to distinguish between highly erodible soils and other soils, thus permitting simulation of Conservation Reserve Program and conservation compliance issues.

Volunteers

The Earth Team grew by 54 percent in 1989. This was a jump from 8,222 volunteers in 1988 to 12,690 in 1989. The number of volunteer hours grew by 24 percent (256,049 in 1988 versus 316,614 in 1989). At an average value of $8 per hour, volunteers contributed $2.533 million in services. The Earth Team, attracting people from all walks of life, is an effective way to mobilize citizens concerned about the environment and the conservation of soil, water, and all natural resources. SCS is seeking more volunteers.

Water Quality and Quantity

The USDA Water Quality Program plan to support the Administration's Water Quality Initiative was completed in July 1989. The educational and technical assistance (E&TA) component of this plan, for which SCS shares leadership responsibility with the Extension Service, includes 8 demonstration projects and 37 hydrologic unit areas to address nonpoint-source water quality concerns. The plans of work for the demonstration projects are undergoing final review by the interagency E&TA committee and funding for those approved will be released soon after. The 37 hydrologic unit areas have been identified and plans of work were scheduled to be completed for review by January 15, 1990. Implementation of demonstration projects and hydrologic units will begin in 1990. Technical assistance has also been authorized for regional multistate water quality projects: Chesapeake Bay, Gulf of Mexico, Puget Sound, Great Lakes, and Tennessee Valley Land and Water 201.

The SCS Water Quality and Quantity Operations (5-Year Plan) is undergoing final agency review. This plan sets forth the planned water quality and quantity activities and schedule for the 1990-94 period. Included are program objectives, technology development, and project implementation schedules to expand the agencies' water quality effort and support the Water Quality Initiative. Eight additional demonstration projects and another 37 hydrologic unit areas are scheduled to be implemented in 1991.

Windbreaks

An estimated 2,950 miles of field windbreaks were planted in 1989 with SCS technical assistance. These barriers will protect crops, livestock, and water quality, and reduce soil erosion by wind. The agency held windbreak technology training courses in 1989 at Fort Collins, Colo., and Bismarck, N. Dak. About 1,300 acres of field windbreaks were planted on cropland placed in the Conservation Reserve Program. Living snowfences were planted along public roads in over 11 States. The National Windbreak Information Campaign was completed with videos, factsheets, bulletins, and other materials distributed. WINDSPEC, the CAMPS module designed to assist field office staffs in planning windbreaks, is being field-tested.

Workforce 2000

An SCS-sponsored conference in FY 1988 on the changing nature of the American workforce allowed employees to identify many issues with regard to several changing workforce trends. In FY 1989 an implementation strategy and action plan was developed that included four major objectives to be accomplished:

- Strengthen communications at all levels;
- Initiate a program for career counseling;
- Clarify the agency position on mobility; and
- Develop agency policy on family-care issues.

National implementation included incorporation of Workforce 2000 action items into annual plans of operation and the development of policy statements and strategies with regard to foreseeable trends in the SCS workforce.

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"I work with government agencies all the time...I've never seen such a fast response to a local request for help."

Maine Church Saved

DAVE RICKER, code enforcement officer in Caribou, Maine, needed to rescue the local Unitarian Church from the stream that was undercutting it.

On a Thursday, Ricker, through the St. John Aroostook Resource Conservation and Development (RC&D) coordinator, reached the Soil Conservation Service.

Next Monday, an SCS Emergency Watershed Protection (EWP) Team saw that a watershed emergency existed: heavy rains had undercut the steep south side of Caribou Stream behind Grove Street, creating an imminent threat to property and lives. SCS prepared repair specifications.

Next Thursday, contractors viewed the site and made bids.

The bidder selected would build a T-wall lock and riprapping and do revegetation. Construction costs were reimbursable under EWP. The Central Aroostook Soil & Water Conservation District sponsored the project and obtained land rights. The town would rebuild the street.

Construction started 18 days later. Streambank stabilization was completed in 3 weeks.

"I work with government agencies all the time," said Ricker. "I've never seen such a fast response to a local request for help."

Paul G. DuMont, associate editor, *Soil & Water Conservation News,* SCS, Washington, D.C.

EWP construction efforts kept undercut bank of Caribou Stream in Maine from collapsing under Unitarian Church. (SCS photo.)

The next Monday an SCS interdisciplinary team ...climbed the canyons to find out what did happen.

Utah Canyon Survives Fire and Flood

THIS UTAH SUCCESS story features fire and flood. In between were the Soil Conservation Service's Emergency Watershed Protection (EWP) measures that were installed—and worked!

In early September 1988, a fire at Affleck Park burned 5,600 acres of mountainous Utah east of Salt Lake City. Over 3,000 of the scorched acres were in the five smaller canyons, Freeze, Brigham, Killyon, Secret, and Hairpin, of the Emigration Canyon Watershed.

Resource destruction here from this natural disaster created an imminent threat to property and lives. The area qualified for immediate Federal assistance under the National Emergency Watershed Protection (EWP) Program, administered by SCS.

An EWP Team of Robert Rasley, SCS State geologist, and Craig Nelson, Salt Lake County geologist, carefully stepped their way through an erosion-sedimentation study on the still-smoking burn site. They determined that excessive sedimentation and debris flows could occur if triggered by a storm of severe intensity.

SCS recommended immediate plantings of orchard grass, smooth brome, intermediate wheatgrass, and alfalfa. They also recommended installation of wire gabions (rock baskets) and of wire fences and fabric to hold back possible debris slides until the ground cover, understory, and canopy vegetation became fully reestablished.

The revegetation plus grade stabilization structures were determined to be as effective as debris basins at one-third the cost. Salt Lake County completed recommended EWP plantings and construction in the five-canyon area by December.

The danger they were protecting against hit only 6 months later. On June 9, 1989, an extremely intense "microburst" within a thunderstorm cell poured down Freeze and western Brigham Canyons into the homes and businesses along Emigration Creek. The people suffered flood damage, which they thought wasn't supposed to happen.

The next Monday an SCS interdisciplinary team composed of Mark Petersen, State range conservationist; Joseph Hanson, State construction engineer; Terril Stevenson, geologist; and Stephen Rogers, civil engineer, plus Rasley climbed the canyons to find out what did happen.

"In upper Freeze, there was significant debris flow," said Rasley. "Many rocks and boulders over a foot in diameter had been moved. But the debris traveled only about one-third the distance from the upper canyon to the mouth."

"Without the gabions and fences," said Hanson, "rocks and boulders would have swept all the way to Emigration Creek."

"These structures were designed for a 10-year storm event," said Rogers. "This storm flow was one-third in excess of design, yet the structures held for the most part."

"The grasses, forbs, and oak suckers really took hold," said Petersen. "They're controlling 80 percent of the potential erosion now. By this coming fall it should be 90 percent."

What had happened, the SCS team found, was that damage at the mouths of Freeze and Brigham Canyons was caused by storm drains being too small and by residences and adjacent landscaping blocking the canyon outlets.

Flood damage along Emigration Creek resulted from constrictions of the flow path by driveway bridges and culverts at too frequent intervals.

Under EWP agreement, Salt Lake County officials will carry out needed operations and maintenance repairs on the gabions and fences.

"We recommended that a detailed study of Freeze and Brigham Canyons be made, that outlets at the canyon mouths be enlarged, and that culverts be enlarged and driveway bridges be rebuilt along the Emigration Creek channel," said Frank Holt, SCS State conservationist.

Salt Lake County officials, through an ongoing program, are working on proposals now to reduce the flooding potential at the canyon mouths and along Emigration Creek.

Paul G. DuMont, associate editor, *Soil & Water Conservation News,* SCS, Washington, D.C.

Moving?
Send present mailing label and new address including zip code to:

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Soil Conservation Service
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Washington, D.C. 20013-2890

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Conservation Calendar

March	4-7	National American Wholesale Grocers Association Convention, New Orleans, La.
	5	National Farmers Union Convention, Oklahoma City, Okla.
	6	Symposium of the Institute of Alternative Agriculture, Washington, D.C.
	7	USDA Regional Training Conference for Women, Kansas City, Mo.
	8-10	Western Region Ag in the Classroom Conference, Albuquerque, N. Mex.
	8-10	National Pork Producers Council Convention, Lexington, Ky.
	15-16	Symposium of Sustainable Agriculture, Sacramento, Calif.
	20	National Agriculture Day, Washington, D.C.
	25-29	National Grain & Feed Association Convention, Williamsburg, Va.
	26	Texas and Southwestern Cattle Raisers Association Convention, Ft. Worth, Tex.
April	2-5	American Forage & Grassland Council Conference, Roanoke, Va.
	3-5	AgTechnology 90, Feiberg Publishing Company, St. Louis, Mo.
	9-12	Plant Resistance To Insects: Toward A More Sustainable Agriculture, Maryland Continuing Educational Center, College Park, Md.
	22-25	National Agri-Marketing Association 1990 Agri-Marketing Conference, St. Louis, Mo.
	22-25	U.S. Energy Council for Energy Awareness INFO 90, Dallas, Tex.
May	7-13	Public Service Recognition Week, Washington, D.C.
	10-13	American Feed Industry Association Convention, Reno, Nev.
	29-June 1	International Conference on Issues in Food Safety & Toxicology, East Lansing, Mich.